



Premise

DUBBO REGIONAL COUNCIL

Keswick Estate Stages 7, 8 and 9 Boundary Road Dubbo

INFRASTRUCTURE ASSESSMENT

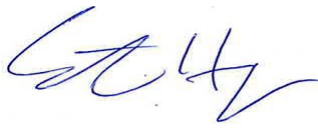
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1. INTRODUCTION

Premise have been engaged by Dubbo Regional Council to prepare an Infrastructure Assessment for the proposed rezoning and intensification of the development of Stages 7, 8 and 9 of Keswick Estate. The land is located in Boundary Road and also fronts Sheraton Road in east Dubbo.

This high level Infrastructure Assessment has been prepared to determine the servicing requirements to support the proposed lot yield that could be developed across the site.

1.1 Project Description

Dubbo Regional Council intends to intensify the development of the subject land by the proposed rezoning of R2 land to R1 land and to reduce the lot sizes on the R2 land. Council's Masterplan documentation indicates that the Planning Proposal for the land would seek to carry out the following amendments to the zoning of the site:

- Part of the land is to be rezoned from R2 – Low Density Residential to R1 – General Residential.
- R2 Low Density Residential lot sizes changed from 600m² to 200m².

Based on the proposed intensification of the development density, the anticipated high level Infrastructure Assessment for Stages 7, 8 and 9 of Keswick Estate would include:

- Potable water reticulation and water demands on the external water reticulation network.
- Sewage generation and assessment of available downstream sewerage reticulation network capacity.
- Preliminary traffic generation.
- Gas reticulation.
- Electricity reticulation.
- Communication services (telephone, internet/NBN).

The objective for preparing this Infrastructure Assessment is to determine an economic means of providing the required infrastructure to the subdivision area to allow the development of the land for the proposed rezoning of the site for a higher residential density.

The outcomes of the assessment of the infrastructure requirements for the rezoning of the land are summarised in this Report.

1.2 Site Locality

The Keswick Estate Stages 7, 8 and 9 development site is located in Boundary Road and the land also fronts Sheraton Road in east Dubbo. The land is described as Lot 101 in DP1301426 and comprises an approximate overall development area of 70.5 ha.

The land is bounded by Boundary Road to the south, Sheraton Road to the east, Dubbo Sports World and the Dubbo Christian School to the north and the Egret Park Wetlands to the west. Further south of the site is Southlakes Estate that is currently being developed.

Stages 7, 8 and 9 of Keswick Estate is located approximately 1.5km south of the intersection of Sheraton Road and the Mitchell Highway, approximately 3.5km from Orana Mall and approximately 6.5km from the Dubbo CBD area.

The location of Keswick Estate is indicated on the attached **Drawing C001**.

2. PROJECT METHODOLOGY

The methodology to address the outlined high level servicing assessment and infrastructure capacity for the rezoning of Keswick Estate will require the following work tasks to be carried out:

1. Discuss with representatives of Dubbo Regional Council to confirm the proposed range of development densities for the subject area Masterplan for the assessment of the demand criteria for the provision of services. The potential constraints on the land area that may affect the lot yield will be will also be discussed.
2. Review the available existing external servicing infrastructure information to determine the available capacity that may be allocated for the potential development of the subject stages in Keswick Estate, particularly for water supply and sewerage infrastructure.
3. Determine a suitable development density across the site (taking into account any development constraints) to assess the required water demand, sewage generation and other criteria applicable to the proposed development of the subject stages in Keswick Estate.
4. Based on the available capacity of the existing servicing infrastructure, compare the demands required by the development of Stages 7, 8 and 9 of Keswick Estate to determine the augmentation works that may be required to allow the servicing of the site particularly for water supply and sewerage infrastructure.
5. Review the available servicing infrastructure for gas, electricity and communication services and assess the capacity of these services to facilitate the development of the subject stages in Keswick Estate.

Following the assessment of each component of the required servicing infrastructure for the development of Keswick Estate, a Report will be prepared outlining the various investigations carried out and the assessment of existing infrastructure to determine the upgrading and augmentation of servicing infrastructure for the proposed intensification of development across the site.

3. EXISTING SERVICES AVAILABLE TO KESWICK ESTATE

Keswick Estate is provided with servicing infrastructure that will facilitate the development of the land.

Servicing infrastructure that is available includes:

- Sewer reticulation
- Water reticulation
- Stormwater drainage
- Electrical Reticulation and Communications
- Gas reticulation
- Roadworks

Details relating to the existing servicing infrastructure for Stages 7, 8 and 9 of Keswick Estate are outlined below.

Sewerage Reticulation

A sewerage reticulation main is available across the full frontage of the site to Boundary Road. A sewer junction is provided to the separate lot located on the north western corner of the intersection of Boundary Road and Henty Avenue. The downstream sewerage reticulation connects to the sewerage reticulation within Southlakes Estate and ultimately discharges to the Keswick Sewage Pump Station (SPS) located in Hennessy Drive.

Water Reticulation

A water reticulation main is located along the southern side Boundary Road along the full frontage of the site. The water main has been constructed to suit the geometry of the roundabout at the intersection of Boundary Road and Henty Avenue/Stream Avenue with the water main cross connecting to the wider water reticulation network in Boundary Road.

A water main connection is provided to the separate lot located on the north western corner of the intersection of Boundary Road and Henty Avenue.

Stormwater Drainage

A stormwater drainage system in Boundary Road and Sheraton Road has been constructed to suit the geometry of the roundabouts along Boundary Road. Large diameter stormwater drainage pipes have been constructed diagonally under the roundabout at the intersection of Boundary Road and Sheraton Road to allow drainage to discharge to the head of the drainage channel system in Southlakes Estate.

Electricity Reticulation and Communications

Electricity reticulation and communications infrastructure is available in Boundary Road and Sheraton Road.

Low and high voltage electrical reticulation is located in Boundary Road and NBN reticulation is located along the southern side of Boundary Road and each service is available for the full frontage of the site.

Gas Reticulation

Natural gas reticulation is located on the southern side of Boundary Road with an extension across the road to the north western corner of the roundabout at Henty Avenue.

Roadworks

Keswick Estate is well serviced by a road network connecting via Boundary Road and Sheraton Road to Wheelers Lane and the Mitchell Highway.

Roundabouts have been constructed at the intersections of Wheelers Lane and Boundary Road, Boundary Road and Alexandrina Avenue, Boundary Road and Stream Avenue/Henty Avenue, the intersection of Boundary Road and Sheraton Road and Tyrell Drive and the major roundabout at the intersection of Sheraton Road and the Mitchell Highway that was constructed many years ago.

Sheraton Road and Boundary Road are speed limited at 60km/hr.

The existing sewerage reticulation, water reticulation and stormwater drainage available for the development of Stages 7, 8 and 9 of Keswick Estate are indicated on the attached **Drawing C002**, **Drawing C003** and **Drawing C004** respectively.

4. PROPOSED DEVELOPMENT AND DESIGN LOADINGS

4.1 Proposed Development

Dubbo Regional Council intends to intensify the development of the subject land by the proposed rezoning of R2 land to R1 land and to reduce the lot sizes on the R2 land. Council's Masterplan documentation indicates that the Planning Proposal for the land would seek to carry out the following amendments to the zoning of the site:

- Part of the land is to be rezoned from R2 – Low Density Residential to R1 – General Residential.
- R2 Low Density Residential lot sizes changed from 600m² to 200m².

Based on the Keswick Master Plan prepared by Blacksmith Panning and Design and dated May 2024, the Master Plan has the following key elements, noting that "shop top housing" will not be provided within the proposed subdivision:

1. *The masterplan provides a broad range of housing types to cater for a range of household types.*
2. *Cultural and heritage items have been retained with a range of open spaces throughout the site. These will require management provisions to be established as well as interpretive signage to explain the significance of each item.*
3. *The road network is a modified grid pattern which provides good route choice and a clear movement hierarchy through the new neighbourhood. Good pedestrian access is maintained through a series of greenways.*
4. *Open spaces are overlooked by housing typologies which allow for good casual surveillance. Rear lanes allow housing to open onto open space areas activating spaces.*
5. *A large stormwater detention basin is located on the southern boundary of the site. The basin provides an opportunity to contribute to the landscape and open spaces values of the site and provide an opportunity to promote housing diversity.*

The Keswick Masterplan assessed the Development Yield across the site. Based on a developable area of 70.5ha, the Masterplan determined that the following dwellings lots are generated:

R1 Residential Lots	278
R2 Residential Lots	790 lots
Total Lots	1,068 lots

Open Space 5.6ha

Net Residential Density 15 dwellings/ha

However, since the Keswick Masterplan was prepared, a separate lot was subdivided by Council on the north western corner of the intersection of Boundary Road and Henty Avenue. This parcel of land is nominally 3.6ha and therefore reduces the developable area for the subject stages of Keswick Estate to approximately 67.0ha.

Based on the Keswick Masterplan Net Residential Density of 15 dwellings/ha, the revised total lots to be developed in Stages 7, 8 and 9 of Keswick Estate is approximately 1,005 lots. Using the same ratio of R1 lots and R2 lots outlined in the Masterplan, for the total of 1,005 lots, the proposed lots in each zoning are outlined below:

R1 Residential Lots	262 lots
R2 Residential Lots	743 lots

The Keswick Estate Masterplan layout is indicated on the attached **Drawing C005**.

The assessment of the various development loadings generated by the 1,005 residential dwellings on the development site is set out in the following Sections of this Report.

4.2 Sewage Design Criteria

4.2.1 KESWICK ESTATE

The sewage generation from the approximately 1,005 residential dwellings to be developed within the subject Stages of Keswick Estate can be estimated based on the design criteria outlined in the *NSW Public Works Department Manual of Practice Sewer Design* and Council's policies where the following generation rates will apply:

Residential dwelling house/dual occupancy	1 ET per dwelling
Medium density dwelling unit	0.5 ET per unit

Based on these criteria, the estimated sewage generation from development of the 1,005 residential dwellings in Keswick Estate at 1 ET per dwelling can be calculated as approximately 1,005 ET.

4.2.2 OTHER SEWAGE CATCHMENTS

Previous infrastructure assessments carried out by Premise and relating to the development of Southlakes Estate and Sheraton View have determined the sewage generation from other sewage catchments that drain through the sewerage reticulation in Southlakes Estate and discharging to the Keswick Sewage Pump Station (SPS).

Other sewage catchments relevant to the rezoned intensification of Keswick Estate include:

- Council's Keswick Estate (based on a previous assessment);
- Industrial Candidate Area No. 1;
- Sheraton View (formerly known as O'Connor's land).

With regards to Keswick Estate, previous discussions with Council staff (approximately 7-8 years ago) indicated that approximately 650 lots could be developed across the site and an allowance of 720 ET was to be made for the future development of the section of Keswick Estate within the Keswick pump station sewage catchment. The previous discussions with Council staff related to the area now known as Stages 7, 8 and 9 of Keswick Estate.

With regards to Industrial Candidate Area No. 1, Council had previously determined that an allowance of 200 ET is to drain southwards and be included in the sewerage reticulation within Southlakes Estate and connecting to the Keswick SPS.

With regards to Sheraton View (O'Connor's land), a previous assessment of the Keswick SPS allocated a sewage generation to the site of 60 ET.

However, a recent reassessment of the development of the land determined that the estimated ET loading from Sheraton View could now be 143 ET. On the basis of the previous allocation of 60 ET to the site, the net increase in sewage generation for the intensification of the development on Sheraton View is 83 ET.

The original sewage generation from land parcels north of Boundary Road and draining to the Keswick SPS included:

- Keswick Estate:	720 ET
- Industrial Candidate Area No. 1:	200 ET
- O'Connor's Land:	60 ET
Total	980 ET

The intensification of developments north of Boundary Road and within the sewerage catchment for the Keswick SPS provides the following sewage generation:

- Keswick Estate:	1,005 ET
- Industrial Candidate Area No. 1:	200 ET
- Sheraton View:	143 ET
Total	1,348 ET

The intensification of subdivision development on parcels of land north of Boundary Road results in the sewage generation of an additional 368 ET draining to the Keswick SPS.

We understand that the existing Keswick Sewage Pump Station is to be upgraded within the next 5 years. Council should therefore ensure that the increase in the sewage generation from land parcels north of Boundary Road be included in the flow rate assessment in the reticulation system at the time when the SPS is upgraded.

4.3 Water Demand Criteria

The water demand criteria normally used for the design of water reticulation systems to service subdivisions is based on standard criteria outlined in the *NSW Public Works Department Water Supply Investigation Manual*, namely:

Peak Instantaneous Demand	0.15 L/s/tenement
Peak Daily Demand	5,000 L/day/tenement

However, in Dubbo Regional Council's *AUSPEC-1 Part D11 Water Reticulation*, the Peak Instantaneous Demand is taken to be 0.10 L/s/tenement.

Additionally, water supply authorities are moving away from the adoption of a peak daily demand of 5,000 L per day per tenement. Peak Daily Demands in the range of 2,000 L per day to 3,000 L per day are commonly used.

For the assessment of the Peak Daily Demand for the rezoned development of Keswick Estate, a demand of 2,000 L/day/residential lot will be adopted.

For the expected development of 1,005 dwellings (1,005 ET) in Keswick Estate, the following water demands can be estimated:

Peak Instantaneous Demand	100.5 L/s
Peak Daily Demand	2.01 ML

4.4 Traffic Generation

The Roads and Traffic Authority's *Guide to Traffic Generating Developments* publishes data on the traffic generating potential of various developments ranging from residential subdivisions, commercial premises, retail premises and industrial developments.

For residential subdivisions, the *Guide to Traffic Generating Developments* indicates that the following range of traffic generation for daily vehicle trips and weekday peak hour vehicle trips as indicated below:

- Dwelling Houses

Daily vehicle trips = 9 per dwelling

Weekday peak hour vehicle trips = 0.85 per dwelling

- Medium Density Residential Dwellings

Smaller units and flats (up to 2 bedrooms)

Daily vehicle trips = 4 to 5 per dwelling

Larger units and townhouses (3 or more bedrooms)

Daily vehicle trips = 5 to 6.5 per dwelling

Weekday peak hour vehicle trips = 0.5 to 0.65 per dwelling

Dubbo Regional Council has had discrete traffic assessments carried out on selected streets within the City by TEC Pty Ltd that indicates the traffic generation rates attributable to dwelling houses in Dubbo are higher than the generation rates determined by the RTA.

The applicable traffic generation rates that are adopted for use within Dubbo are summarised below:

- Dwelling Houses
- Daily vehicle trips = 11 trips per dwelling
- Weekday peak hour vehicle trips = 1.0 trip per dwelling
- Medium Density Residential Dwellings
- Daily vehicle trips = 6 trips per dwelling
- Weekday peak hour vehicle trips = 0.5 trips per dwelling

Based on the adopted traffic generation rates and the proposed rezoning of the land within Keswick Estate, the daily and peak hour traffic generation for the intensification of the development is set out in the following Sections of this Report.

4.4.1 DAILY TRAFFIC GENERATION

The daily traffic volume generated by the intensification of the development of Keswick Estate can be estimated from:

Number of dwellings: 1,005 dwellings

Daily vehicle trips: 11 trips per dwelling

Number of daily trips: 11,055 trips per day

The rezoning of Stages 7, 8 and 9 for the intensification of the development in Keswick Estate will generate 11,055 trips per day onto the surrounding road network.

4.4.2 PEAK HOUR TRAFFIC GENERATION

The peak hour traffic volume generated by the intensification of the development of Keswick Estate can be estimated from:

Number of dwellings:	1,005 dwellings
Peak hour vehicle trips:	1.0 trip per dwelling
Number of peak hour trips:	1,005 trips per hour

The rezoning of Stages 7, 8 and 9 for the intensification of the development in Keswick Estate will generate 1,005 trips per hour onto the surrounding road network.

4.4.3 TRAFFIC IMPACT ASSESSMENT

In order to support the rezoning application for the development of approximately 1,005 residential dwellings across the site, a Traffic Impact Assessment report should be prepared in accordance with Schedule 3 of *State Environmental Planning Policy (Transport and Infrastructure) 2021*.

The ISEPP classifies developments based upon the potential to generate additional traffic onto the surrounding road network.

Developments listed in Schedule 3 of SEPP (Transport and Infrastructure) require referral to Transport for NSW (TfNSW) by the consent authority. The consent authority is required to take into consideration any submission that TfNSW provides in response to the notice of the development.

In addition, the consent authority must consider, pursuant to Clause 2.121 of SEPP (Transport and Infrastructure), the accessibility of the site and any potential traffic safety, road congestion or parking implications of the proposed development.

In Schedule 3, the development type is described in Column 1. The size or capacity of the development with access to any road is set out in Column 2. The size or capacity of the development with access to a classified road or to a road that connects to a classified road within 90m of the classified road is set out in Column 3.

Based on Schedule 3, the classification of subdivisions as outlined in Column 2 states:

Subdivision of Land *200 or more allotments where the subdivision includes the opening of a public road*

Based on Schedule 3, the classification of subdivisions as outlined in Column 3 states:

Subdivision of Land *50 or more allotments*

As the proposed rezoning of Stages 7, 8 and 9 of Keswick Estate will generate the development of approximately 1,005 dwellings, the subdivision is classified under Column 2 of Schedule 3 in the ISEPP and a Traffic Impact Assessment is required to be prepared.

5. PROPOSED SERVICING INFRASTRUCTURE

The proposed servicing infrastructure required for the rezoning and intensification of the development of Keswick Estate is outlined in the following Sections of this Report.

To inform the provision of servicing infrastructure, the existing contours across the site are indicated on the attached **Drawing C006**.

5.1 Sewerage Reticulation

The Servicing Strategy for Southlakes Estate previously prepared by Premise determined that the overall sewage catchment draining to the Keswick Sewage Pump Station, the reticulation mains within Southlakes Estate and the Keswick pump station will need to cater for the following sewage loadings:

Southlakes Estate extension	1,703 ET
Future Keswick subdivision	720 ET
Future O'Conner subdivision	60 ET
Industrial Candidate Area No. 1	200 ET
Total Sewage Loading	2,683 ET

However, as outlined in **Section 4.2.2** of this Report, the intensification of subdivision development on parcels of land north of Boundary Road results in the sewage generation of an additional 368 ET draining to the Keswick SPS.

Based on the current assessed sewage loading for the Keswick Sewage Pump Station catchment of 2,683 ET, the additional 368 ET represents an increase of 13.7% in the total sewage loading.

Given that the Keswick SPS is planned to be upgraded within a 5 year window, the increase in the estimated catchment ET loading draining to the Keswick SPS is not significant and the previously recommended sewerage reticulation for Southlakes Estate and the external catchments are still valid.

The Southlakes Estate Servicing Strategy determined in part the following recommendations:

The Southlakes sewerage reticulation mains are also to be sized to cater for the expected development of land located to the north (Keswick and O'Connor) and Industrial Candidate Area No. 1. To enable these land parcels to be serviced by gravity reticulation to the Keswick pump station, the sewerage mains within the extension of Southlakes will need to be increased in size to cater for the additional sewage generation.

The following components of the sewerage reticulation will be required:

- In general, 150mm diameter, 225mm diameter and 300mm diameter sewer mains will be provided in the southern section of the subdivision draining from east to west to cater for the majority of the future development of land at the eastern extents of the subdivision and the development within the southern section of the extension to Southlakes Estate.
- The major gravity sewer main draining from north to south will comprise a 300mm diameter connection to the land to the north of Boundary Road (Keswick) subsequently increasing downstream to 375mm diameter, 450mm diameter and 525mm diameter.
- The 300mm diameter and 525mm diameter trunk sewer mains join at the southern end of the Southlakes subdivision. Where the trunk mains combine, the gravity connection to the inlet manhole at the Keswick pump station will require the construction of a 600mm diameter sewer main to transfer the expected 2,683 ET's generated from within the overall sewage catchment to the pump station.

In general, the trunk sewerage reticulation mains within Southlakes Estate and the Keswick Sewage Pump Station have sufficient capacity to cater for the current loading generated by approximately 2,683 ET's from within the catchment and for an approximate increase of 13.7% from the intensification of developments north of Boundary Road. The planned upgrade of the Keswick SPS will ensure that again there is capacity in the pump station to cater for the intensification of nominated developments with the sewage catchment.

The indicative sewer main connections for Keswick Estate are shown on the attached **Drawing C007**.

5.2 Water Reticulation

Dubbo Regional Council carried out a WATSYS analysis on the overall water reticulation network for the greater south eastern section of the area encompassing Southlakes Estate, the proposed extension of Southlakes Estate, Holmwood Estate, Magnolia Estate and Macquarie View Estate.

The Council water reticulation modelling indicated that a 250mm diameter trunk water main was required to facilitate the development of the broader Southlakes Estate and Keswick subdivision areas. The 250mm diameter water main traversed Argyle Avenue eastwards to Tyrell Drive, then along Azure Avenue eastwards again to Tyrell Drive and then Tyrell Drive northwards to and across Sheraton Road and terminated on the eastern side of Sheraton Road part way along the western frontage of the Sheraton View site.

The indicative water main connections for Keswick Estate are shown on the attached **Drawing C008**.

5.3 Roadworks

The development of Keswick Estate is well serviced by a road network connecting via Boundary Road and Sheraton Road to Wheelers Lane and the Mitchell Highway.

Roundabouts have been constructed at the intersections of Wheelers Lane and Boundary Road, Boundary Road and Alexandrina Avenue, Boundary Road and Henty Avenue/Stream Avenue, the intersection of Boundary Road and Sheraton Road and Tyrell Drive and the major roundabout at the intersection of Sheraton Road and the Mitchell Highway that was constructed many years ago.

The major point of road access into Stages 7, 8 and 9 in Keswick Estate will be via the roundabout at the intersection of Boundary and Henty Avenue.

The Masterplan layout for Keswick Estate indicates a future roundabout on Sheraton Road midway between the intersection of Boundary Road and Sheraton Road and the southern boundary of St Johns College.

An additional road connection into Keswick Estate is provided generally opposite the southern boundary of St Johns College and along the stormwater corridor in the northern section of the subdivision.

The Masterplan also indicates a future road connection to the north.

The general arrangement of the external road connections providing access to Keswick Estate is indicated on the attached **Drawing C009**.

5.4 Electricity Reticulation and Communication Infrastructure

The low and high voltage electrical reticulation located in Boundary Road and the NBN reticulation located along the southern side of Boundary Road can be extended across Boundary Road to provide the required reticulation, service pillars and street lighting within the road pattern in Stage 7, 8 and 9 of Keswick Estate.

The connection of the internal road network to Sheraton Road will allow the reticulation of electricity and communication infrastructure to also be cross connected to services in Sheraton Road.

5.5 Gas Reticulation

The natural gas reticulation located on the southern side of Boundary Road with the extension across the road to the north western corner of the roundabout at Henty Avenue can be extended to provide the required reticulation and service connections within the road pattern in Stage 7, 8 and 9 of Keswick Estate.

The connection of the internal road network to Sheraton Road will allow the gas reticulation to also be cross connected to services in Sheraton Road.

6. CONCLUSION

This Infrastructure Assessment has determined the infrastructure requirements necessary for the proposed rezoning and intensification of the development density for Stages 7, 8 and 9 of Keswick Estate.

The Infrastructure Assessment for Keswick Estate has included:

- Potable water reticulation and water demands on the external water reticulation network.
- Sewage generation and assessment of available downstream sewerage reticulation network capacity.
- Preliminary traffic generation.
- Gas reticulation.
- Electricity reticulation.
- Communication services (telephone, internet/NBN).

The objective for preparing this high level Infrastructure Assessment was to determine an economic means of providing the required infrastructure to the subdivision area to allow the development of the land for the proposed rezoning of the site for a higher residential density.

The assessment has determined that up to 1,005 dwellings can be developed and adequately serviced on the site.

Potable Water

For the expected development of 1,005 dwellings (1,005 ET) in Keswick Estate, the following water demands can be estimated:

Peak Instantaneous Demand	100.5 L/s
Peak Daily Demand	2.01 ML

Sewerage Reticulation

The intensification of subdivision development on parcels of land north of Boundary Road results in the sewage generation of an additional 368 ET draining to the Keswick SPS.

Based on the current assessed sewage loading for the Keswick Sewage Pump Station catchment of 2,683 ET, the additional 368 ET represents an increase of 13.7% in the total sewage loading.

Given that the Keswick SPS is planned to be upgraded within a 5 year window, the increase in the estimated catchment ET loading draining to the Keswick SPS is not significant and the previously recommended sewerage reticulation for Southlakes Estate and the external catchments are still valid.

Traffic Generation

The intensification of the development by the rezoning of the land will generate 11,055 trips per day and 1,005 trips per hour onto the surrounding road network.

As the proposed rezoning of Stages 7, 8 and 9 of Keswick Estate will generate the development of approximately 1,005 dwellings, the subdivision is classified under Column 2 of Schedule 3 in the ISEPP and a Traffic Impact Assessment is required to be prepared.

Gas Reticulation

The natural gas reticulation located on the southern side of Boundary Road with the extension across the road to the north western corner of the roundabout at Henty Avenue can be extended to provide the required reticulation and service connections within the road pattern in Stage 7, 8 and 9 of Keswick Estate.

Electricity Reticulation and Communication Services

The low and high voltage electrical reticulation located in Boundary Road and the NBN reticulation located along the southern side of Boundary Road can be extended across Boundary Road to provide the required reticulation, service pillars and street lighting within the road pattern in Stage 7, 8 and 9 of Keswick Estate.

This high level Infrastructure Assessment has provided the design guidelines for the provision of services to the subdivision and forms the basis for the future detailed design of the services for the intensification of the development within Stage 7, 8 and 9 of Keswick Estate.

7. DRAWINGS

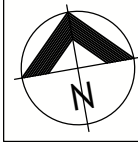
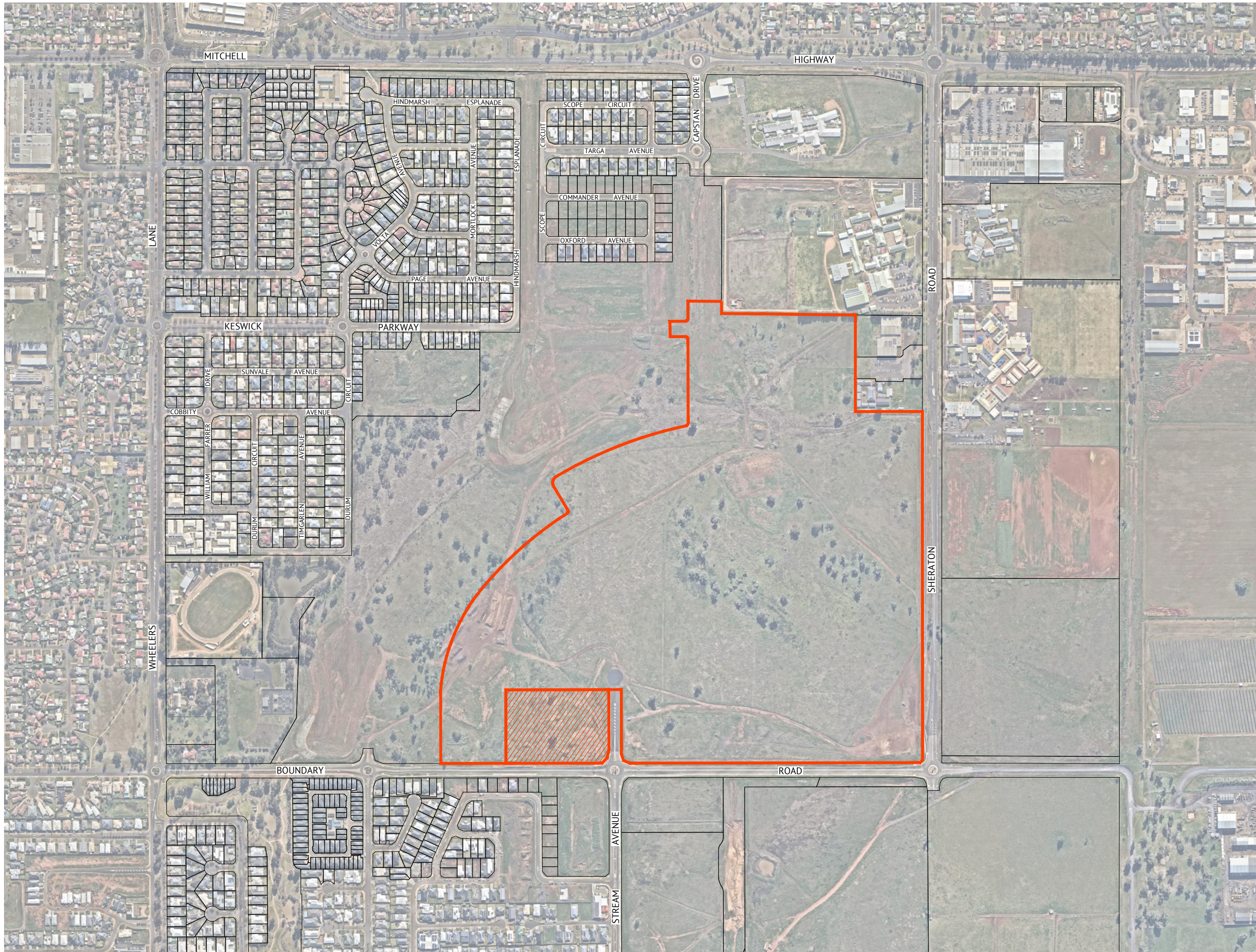
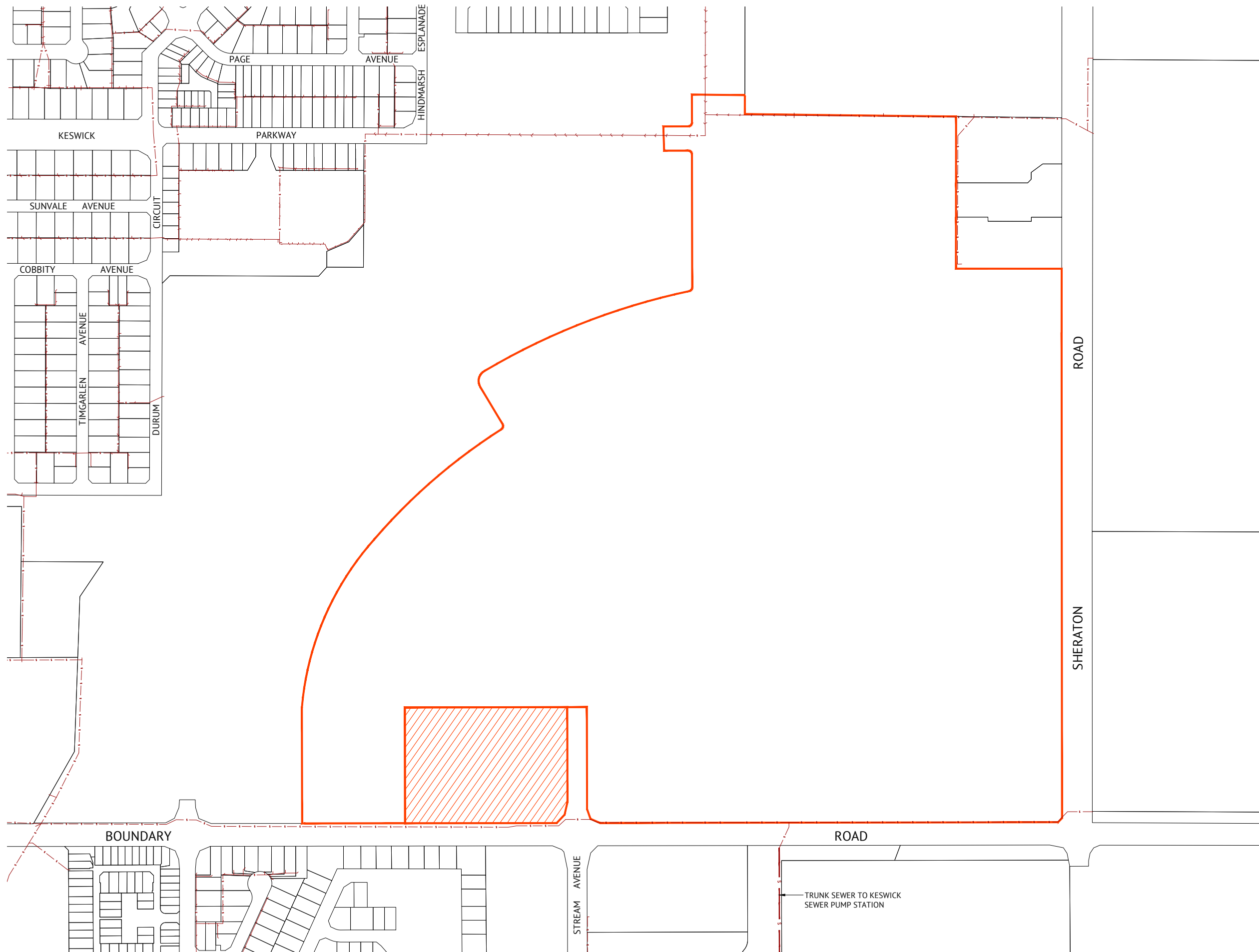


IMAGE SOURCE: NEARMAP (30/07/2024)



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							CHECKED STEPHEN J HOYNES		PROJECT KESWICK INFRASTRUCTURE ASSESSMENT		
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REVISIONS											



LEGEND

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DATE	REV	DESCRIPTION	JE	SIH
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DUBBO, NSW 2830
PH: (02) 6887 4500
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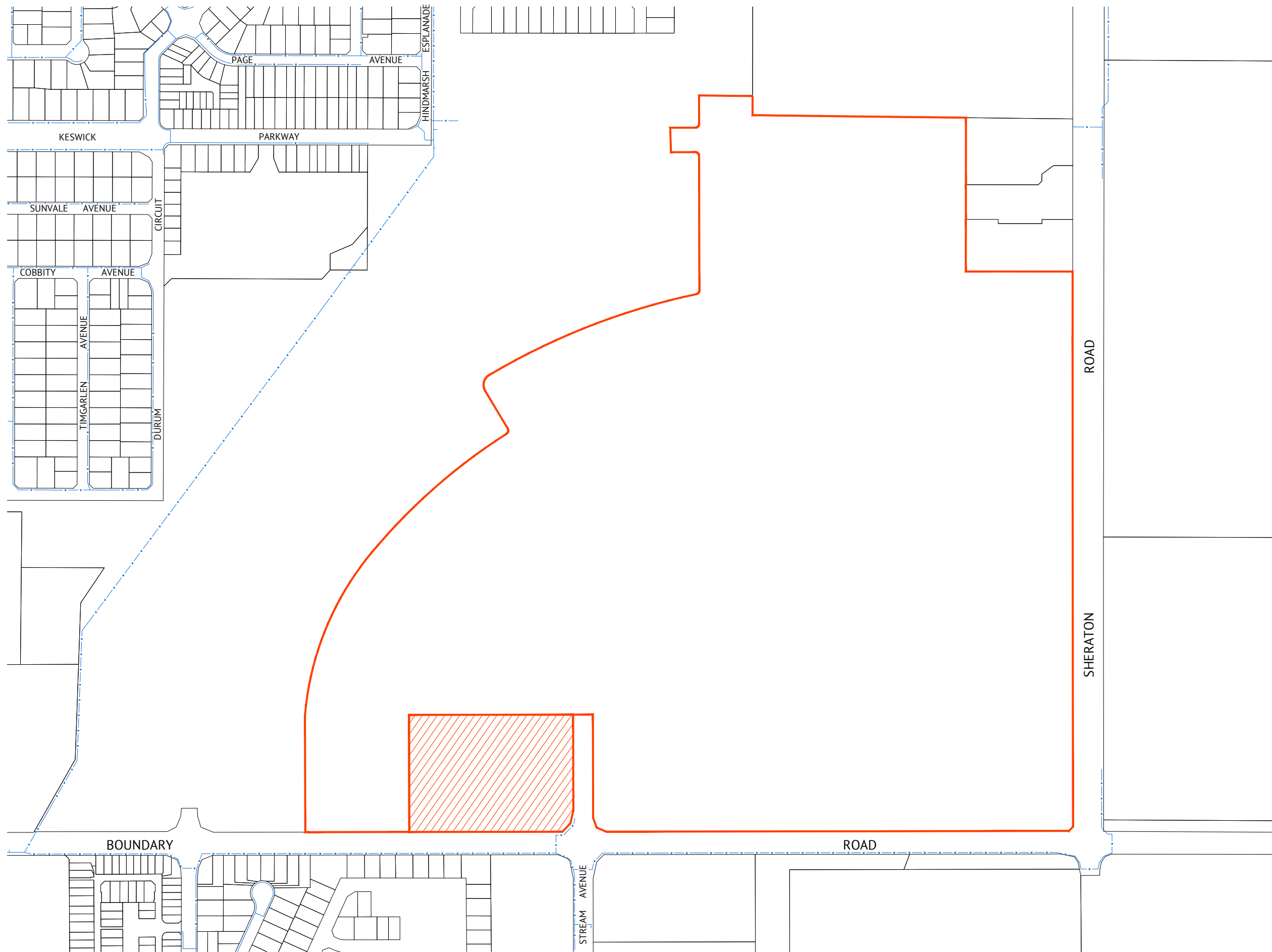
SURVEYED
STEPHEN J HOYNES
CHECKED
STEPHEN J HOYNES
PROJECT MANAGER
STEPHEN J HOYNES
ENGINEERING CERTIFICATION
STEPHEN J HOYNES

18/09/2024

SCALE
SCALE 1:2500 (A1)
0 50 100 150m
SCALE 1:5000 (A3)
0 50 100 150m
ORIGINAL SHEET SIZE A1

CLIENT
DUBBO REGIONAL COUNCIL
PROJECT
KESWICK INFRASTRUCTURE ASSESSMENT
LOCATION
KESWICK ESTATE, DUBBO
SHEET TITLE
EXISTING SEWERAGE RETICULATION

JOB CODE
P001989_01
SHEET NUMBER
C002
REV
A



LEGEND
— w — EXISTING GIS WATER MAIN



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18/09/2024	A	ISSUED FOR REPORT	JE	SIH
DATE	REV	DESCRIPTION	REC	APP
REVISIONS				

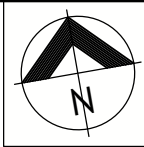
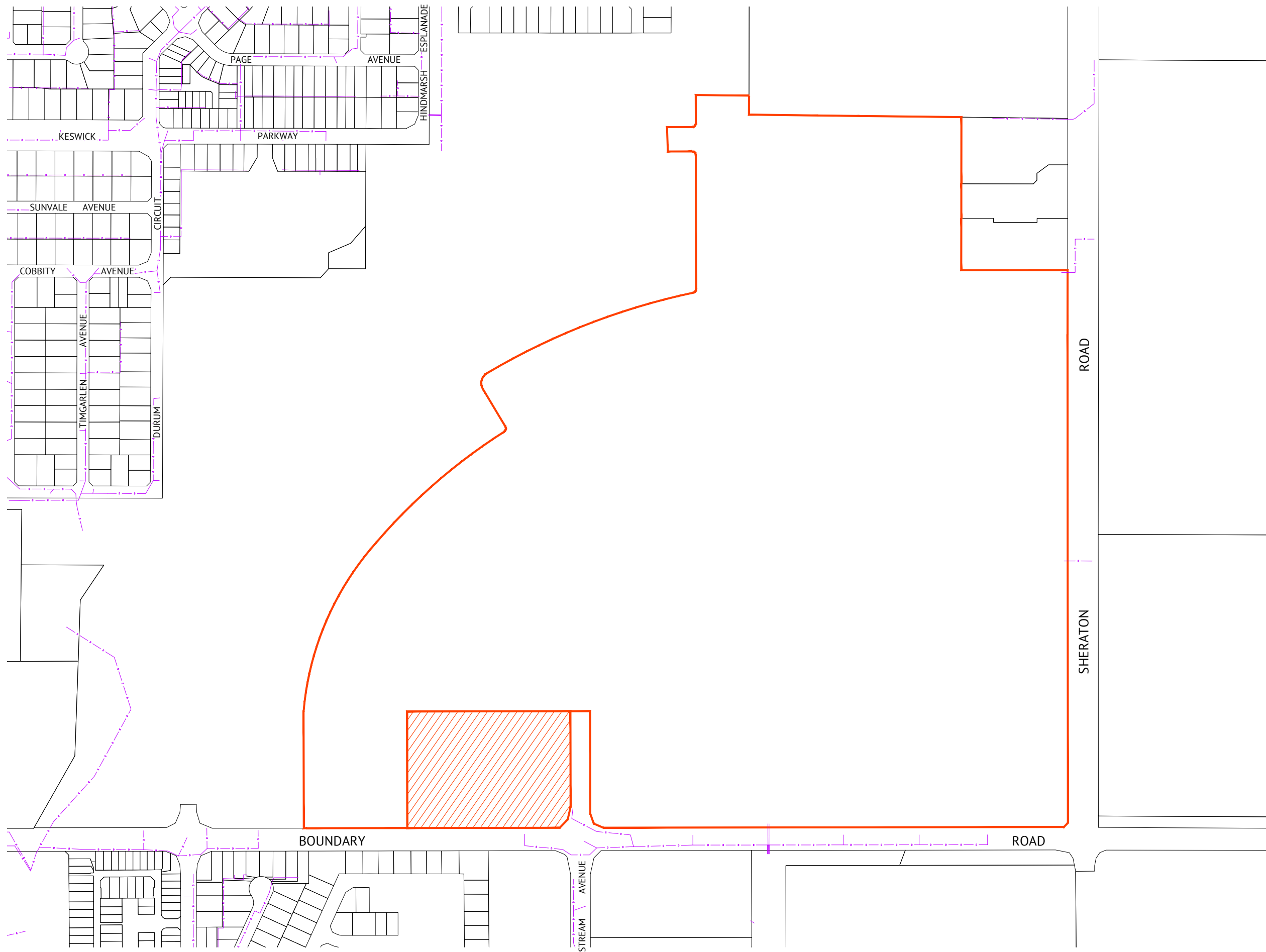


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SURVEYED STEPHEN J HOYNES	18/09/2024
CHECKED STEPHEN J HOYNES	
PROJECT MANAGER STEPHEN J HOYNES	
ENGINEERING CERTIFICATION	
STEPHEN J HOYNES	

SCALE
NOT TO SCALE
ORIGINAL SHEET SIZE A1

CLIENT	DUBBO REGIONAL COUNCIL	JOB CODE	P001989_01
PROJECT	KESWICK INFRASTRUCTURE ASSESSMENT	SHEET NUMBER	C003
LOCATION	KESWICK ESTATE, DUBBO	REV	A
SHEET TITLE	EXISTING WATER RETICULATION		

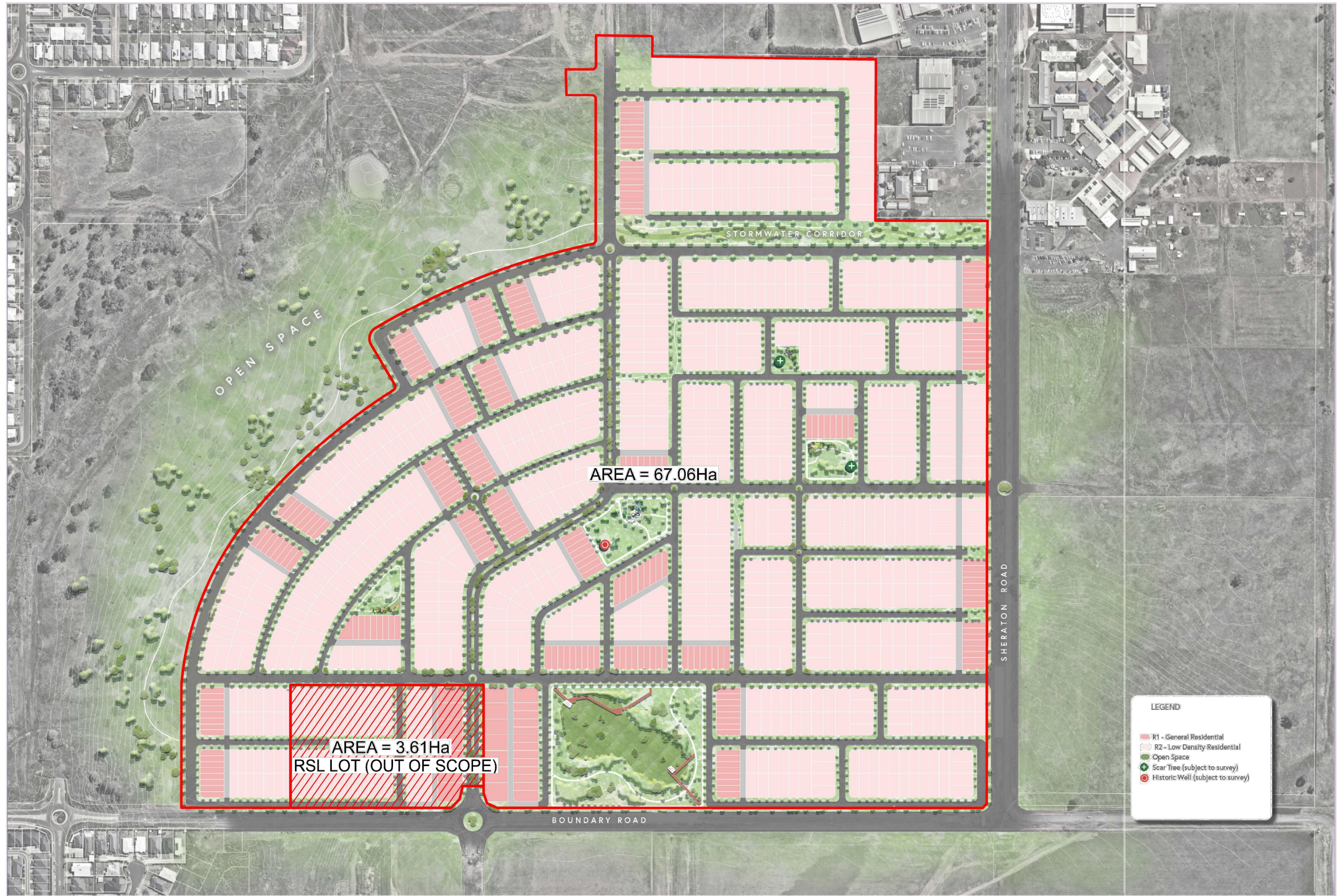


LEGEND
- - - - - EXISTING GIS STORMWATER



ISSUED FOR REPORT					 <div>DUBBO OFFICE 1ST FLOOR 62 WINGEWARRA STREET DUBBO, NSW 2830 PH: (02) 6887 4500 WEB: www.premise.com.au</div>	SURVEYED STEPHEN J HOYNES CHECKED STEPHEN J HOYNES PROJECT MANAGER STEPHEN J HOYNES ENGINEERING CERTIFICATION STEPHEN J HOYNES	SCALE NOT TO SCALE ORIGINAL SHEET SIZE A1	CLIENT DUBBO REGIONAL COUNCIL		JOB CODE P001989_01
PROJECT KESWICK INFRASTRUCTURE ASSESSMENT		SHEET NUMBER C004		REV A						
LOCATION KESWICK ESTATE, DUBBO		SHEET TITLE EXISTING STORMWATER DRAINAGE								

18/09/2024	A	ISSUED FOR REPORT	JE	SIH
DATE	REV	DESCRIPTION	REC	APP
REVISIONS				



Keswick Estate Master Plan
Concept Structure Plan

DATE	75.05.2024
DRAWN	AD
SCALE	1:2000(8A)
REV	B

YouDocsp00009.01

18/09/2024	A	ISSUED FOR REPORT			SIN
DATE	REV	DESCRIPTION			APP
<div style="text-align: center;">REVISIONS</div>					

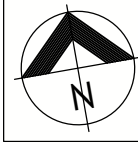
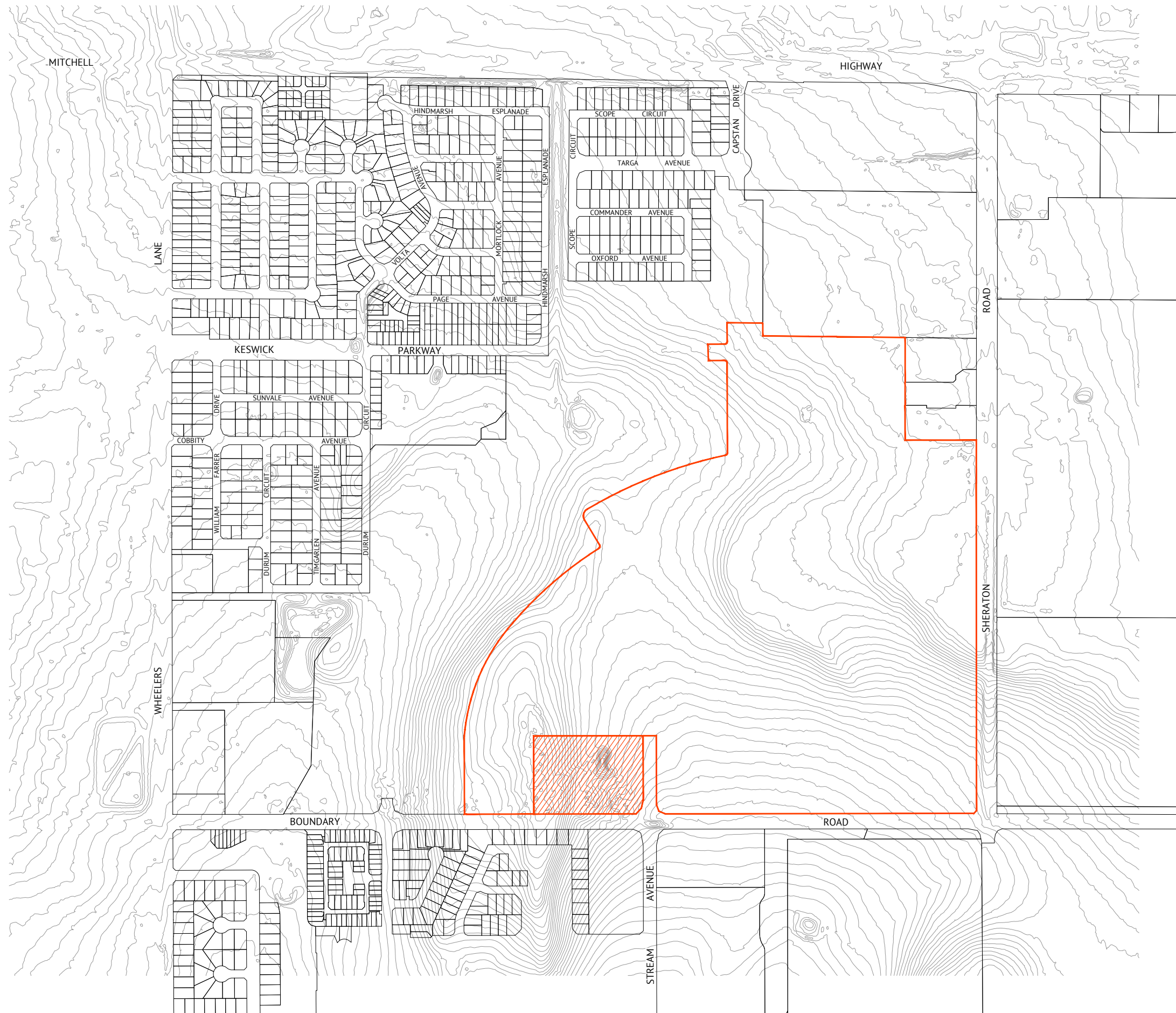


18/09/2024

ORIGINAL SHEET SIZE A1

SHEET TITLE **KESWICK ESTATE MASTERPLAN**

C005	A
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NOTE
CONTOUR INTERVAL 0.5m.

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DATE	REV	DESCRIPTION	REC	APP
18/09/2024	A	ISSUED FOR REPORT	JE	SH



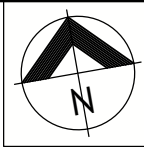
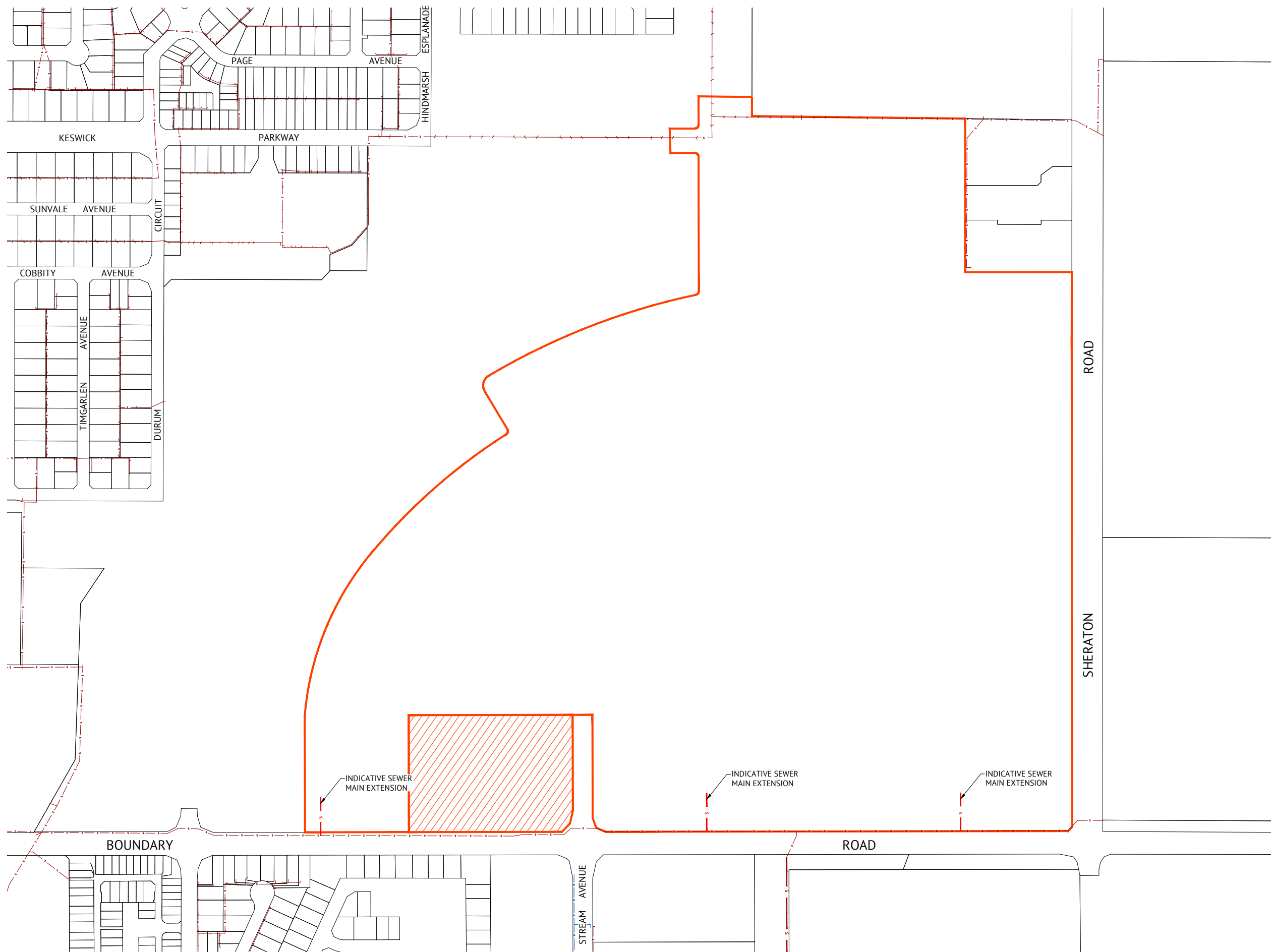
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SURVEYED
STEPHEN J HOYNES
CHECKED
STEPHEN J HOYNES
PROJECT MANAGER
STEPHEN J HOYNES
ENGINEERING CERTIFICATION
18/09/2024
STEPHEN J HOYNES

SCALE
SCALE 1:4000 (A1)
0 80 160 240m
SCALE 1:8000 (A3)
0 80 160 240m
ORIGINAL SHEET SIZE A1

CLIENT
DUBBO REGIONAL COUNCIL
PROJECT
KESWICK INFRASTRUCTURE ASSESSMENT
LOCATION
KESWICK ESTATE, DUBBO
SHEET TITLE
EXISTING SITE CONTOURS

JOB CODE
P001989_01
SHEET NUMBER
C006
REV
A



- LEGEND
- s — EXISTING GIS SEWER
 - - - s - - - PROPOSED SEWER CONNECTION

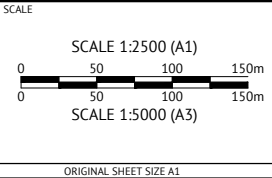


ISSUED FOR REPORT					
18/09/2024	A	ISSUED FOR REPORT	JE	SIH	
DATE	REV	DESCRIPTION	REC	APP	
REVISIONS					



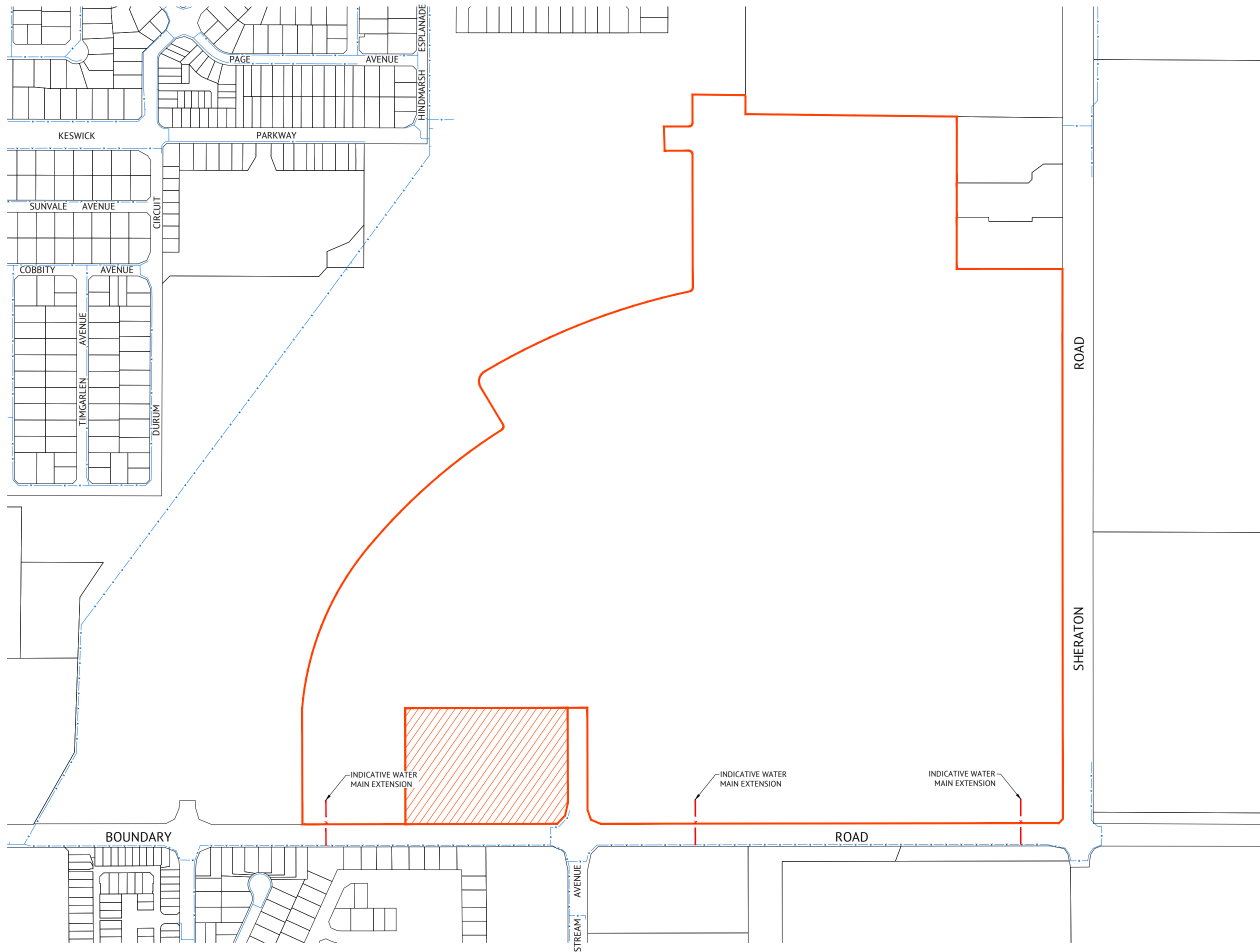
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SURVEYED	18/09/2024
STEPHEN J HOYNES	
CHECKED	
STEPHEN J HOYNES	
PROJECT MANAGER	
STEPHEN J HOYNES	
ENGINEERING CERTIFICATION	
STEPHEN J HOYNES	



CLIENT	DUBBO REGIONAL COUNCIL
PROJECT	KESWICK INFRASTRUCTURE ASSESSMENT
LOCATION	KESWICK ESTATE, DUBBO
SHEET TITLE	INDICATIVE SEWER MAIN CONNECTION

JOB CODE	P001989_01
SHEET NUMBER	C007
REV	A



LEGEND

— w — EXISTING GIS WATER

— w — PROPOSED WATER CONNECTION



ISSUED FOR REPORT

DATE	REV	DESCRIPTION	JE	SIH
18/09/2024	A	ISSUED FOR REPORT	JE	SIH
			REC	APP

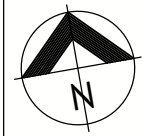
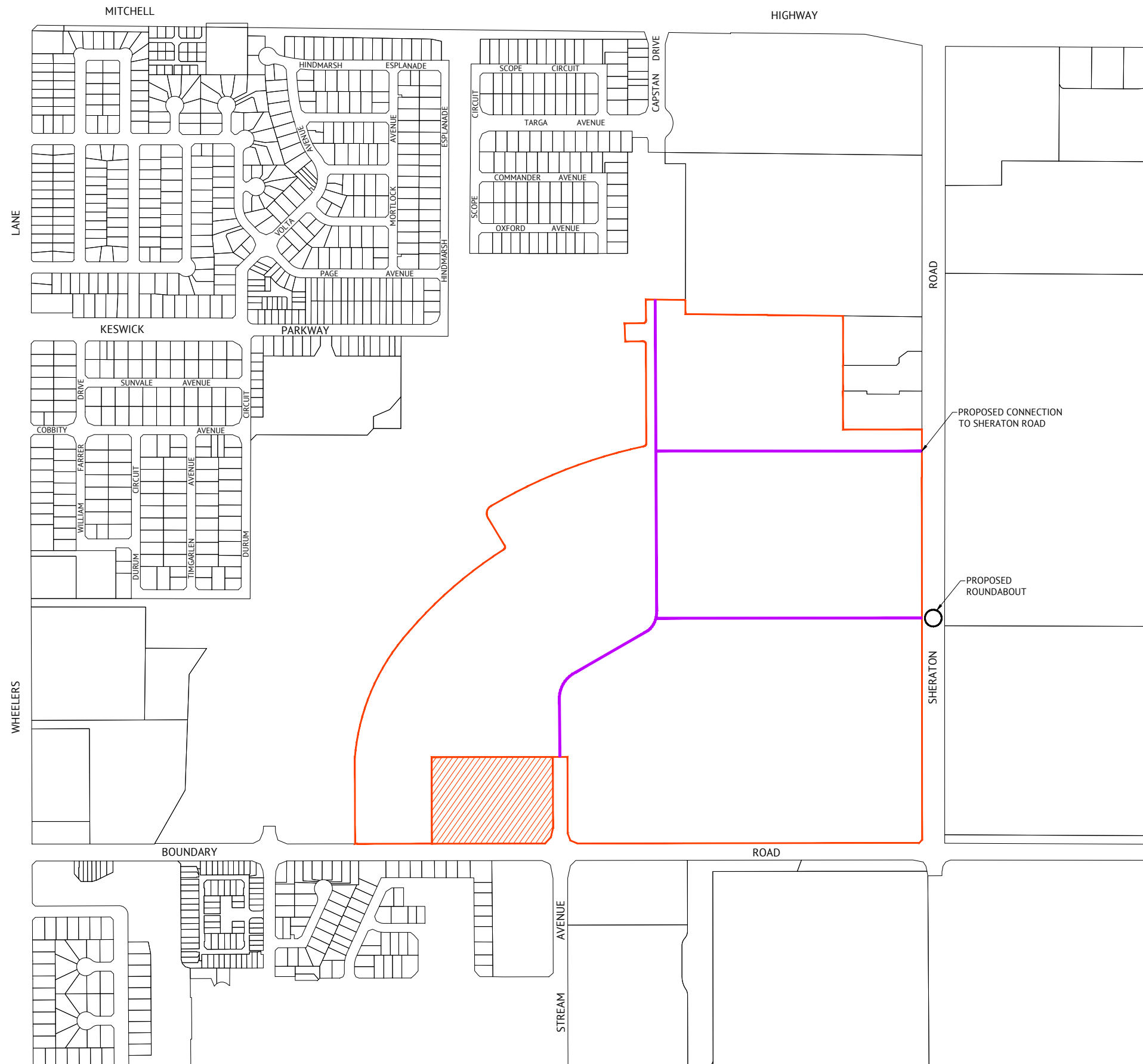


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SURVEYED STEPHEN J HOYNES	18/09/2024
CHECKED STEPHEN J HOYNES	
PROJECT MANAGER STEPHEN J HOYNES	
ENGINEERING CERTIFICATION	
STEPHEN J HOYNES	

SCALE
SCALE 1:2500 (A1)
0 50 100 150m
SCALE 1:5000 (A3)
0 50 100 150m
ORIGINAL SHEET SIZE A1

CLIENT	DUBBO REGIONAL COUNCIL	JOB CODE	P001989_01
PROJECT	KESWICK INFRASTRUCTURE ASSESSMENT	SHEET NUMBER	C008
LOCATION	KESWICK ESTATE, DUBBO	REV	A
SHEET TITLE	INDICATIVE WATER MAIN CONNECTION		



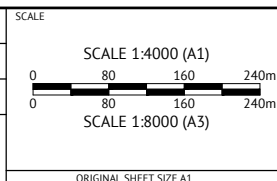
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DATE	REV	DESCRIPTION	REVISIONS
18/09/2024	A	ISSUED FOR REPORT	



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SURVEYED STEPHEN J HOYNES	18/09/2024
CHECKED STEPHEN J HOYNES	
PROJECT MANAGER STEPHEN J HOYNES	
ENGINEERING CERTIFICATION	
STEPHEN J HOYNES	



CLIENT	DUBBO REGIONAL COUNCIL
PROJECT	KESWICK INFRASTRUCTURE ASSESSMENT
LOCATION	KESWICK ESTATE, DUBBO
SHEET TITLE	INDICATIVE ROAD NETWORK

JOB CODE	P001989_01
SHEET NUMBER	C009
REV	A



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